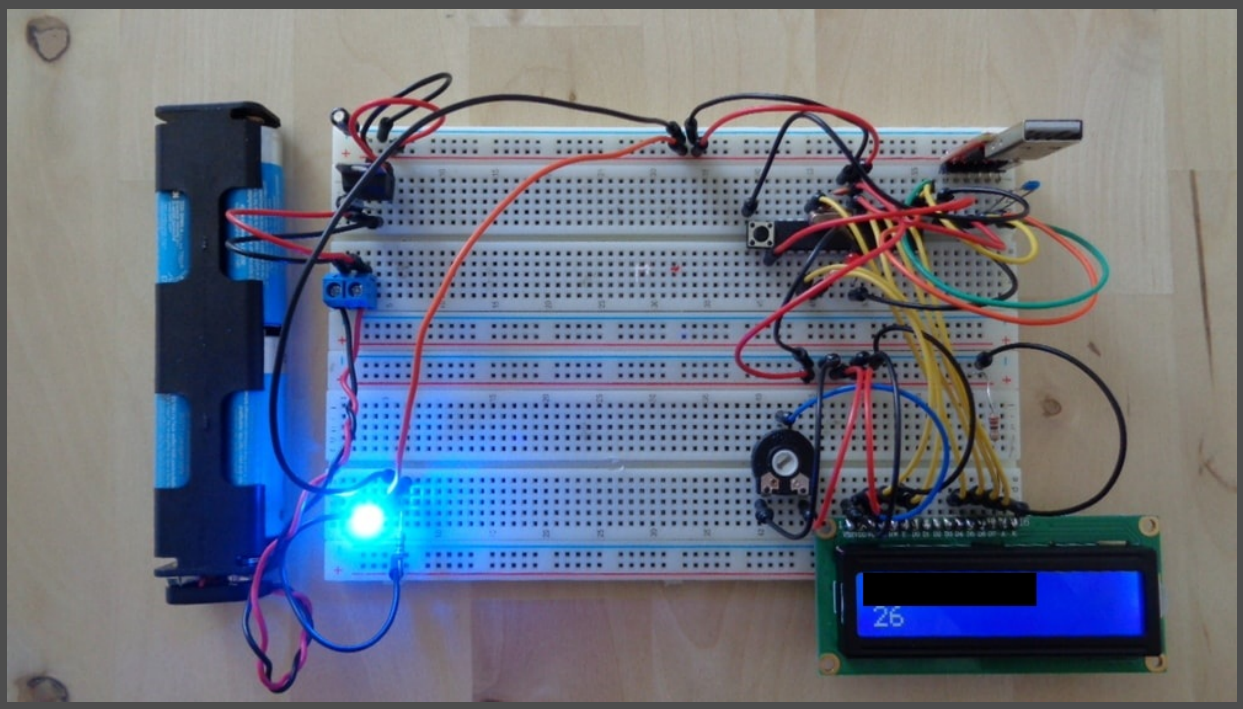


Cyberdeck V4

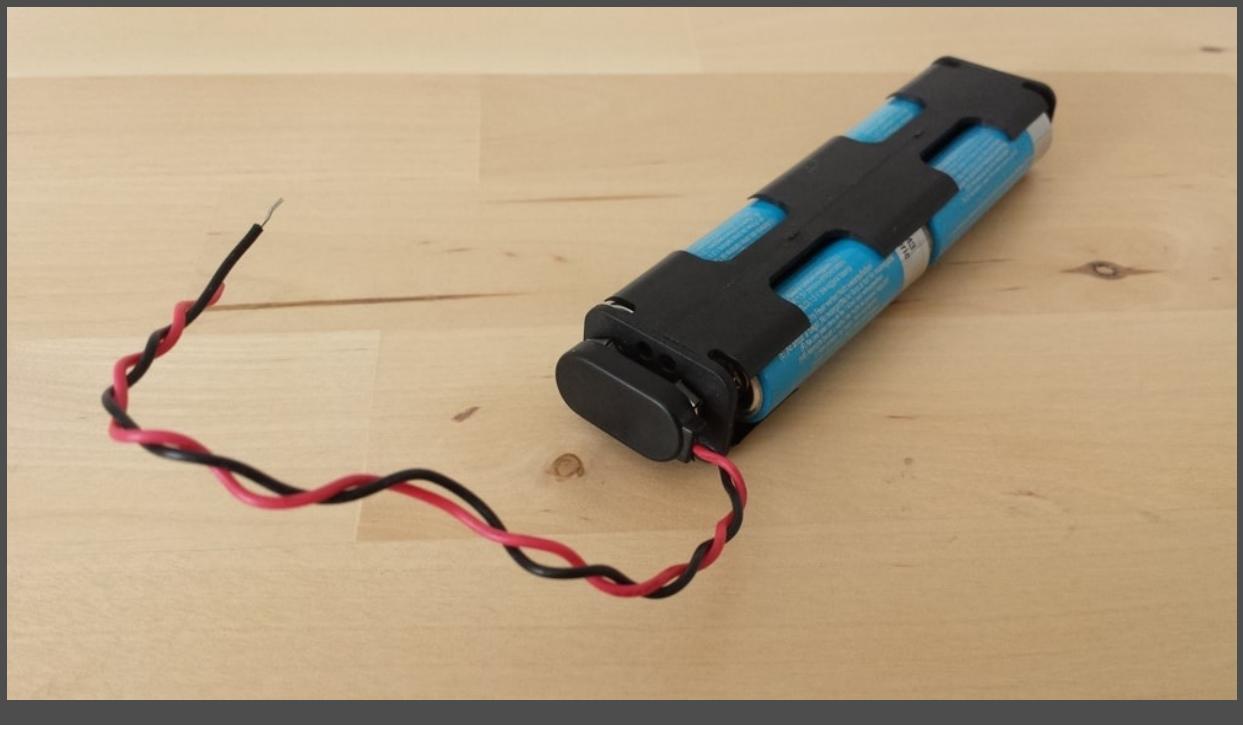
Preface

When designing a cyberdeck, there is no uniform set of rules regarding the structure. The design of the base is based on a keyboard that can be used by the user like a carrier bag. The appearance is influenced in all cases by the personal taste of the developers or materials used. A cyberdeck must therefore have an autonomous power supply in order to be able to function for a few days without charging. For this, electricity must be storable within the construction, e.g. by batteries, accumulators, etc.

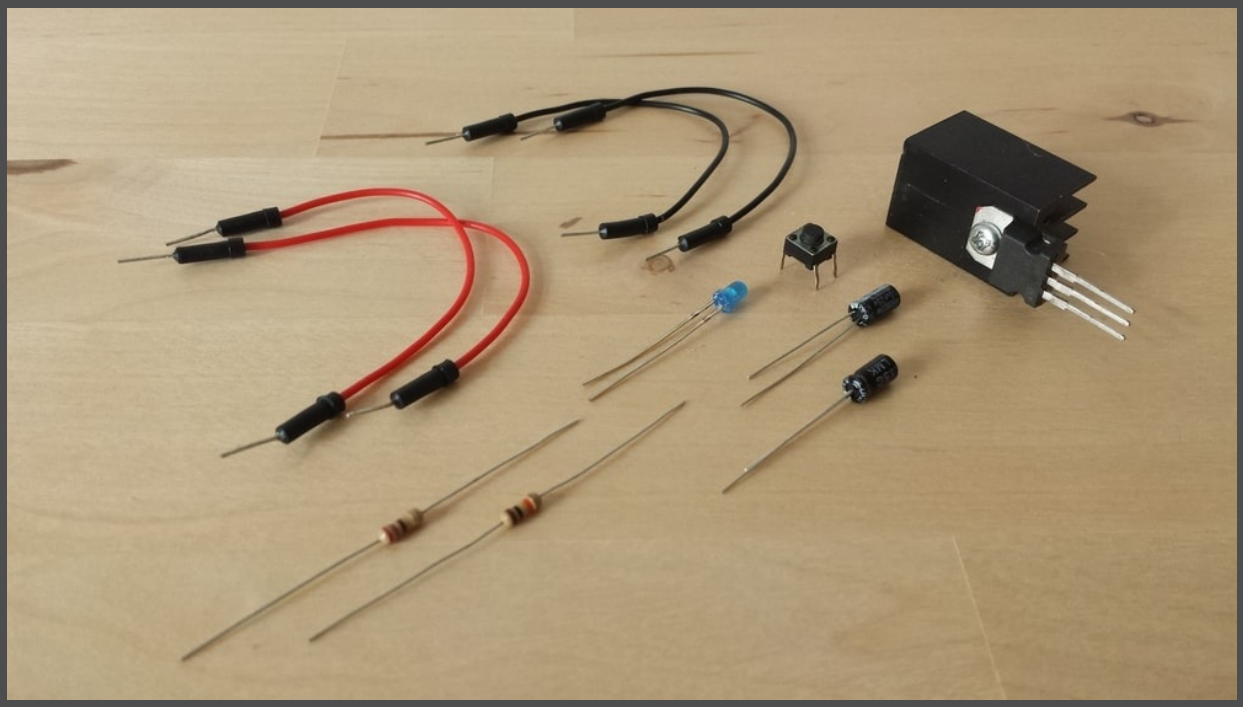
In addition, a reset button is required, which can restart the complete system by rebooting, just like on a desktop computer. This means that the cyberdeck does not have to be isolated from the current power supply. Sometimes the running processes or tasks help to interrupt, for example you can run a programming loop that counts up to infinity and continues until the power supply is interrupted. In the second part of this documentation, a voltage regulator is implemented that allows various power sources to be connected to the cyberdeck.

Materials

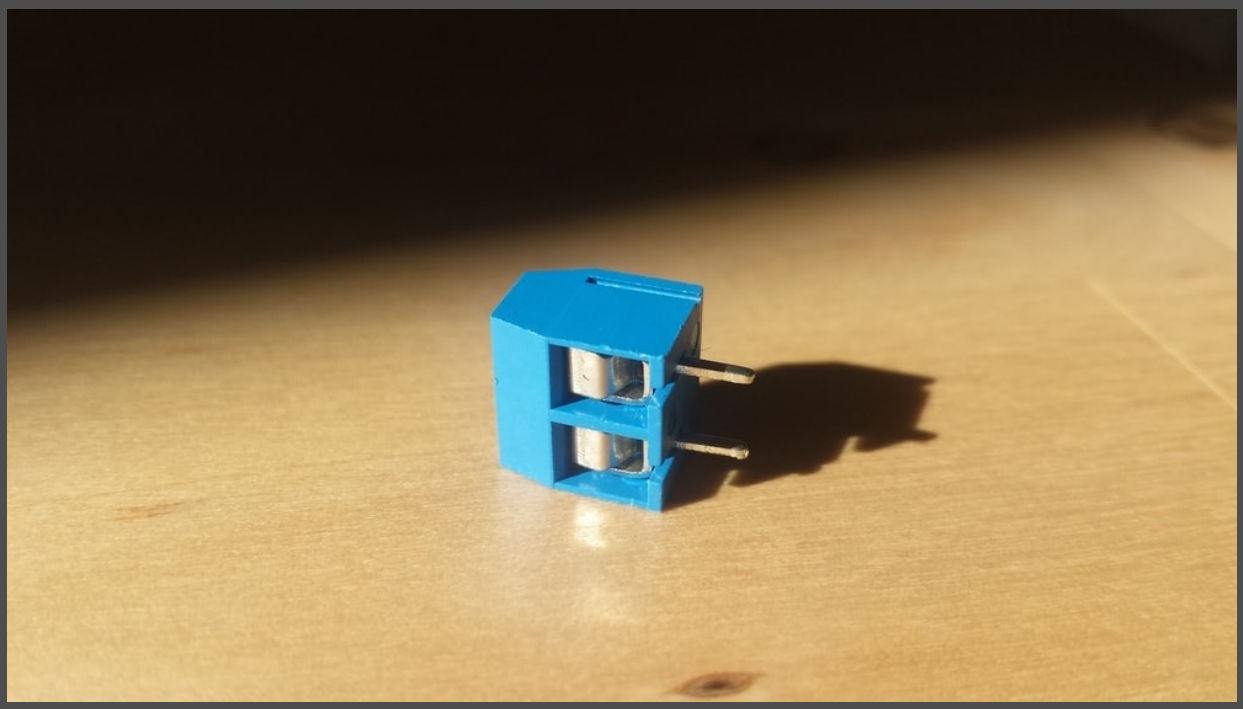
In this project, the material can be purchased from an electronics dealer because there are no special or unusual components.

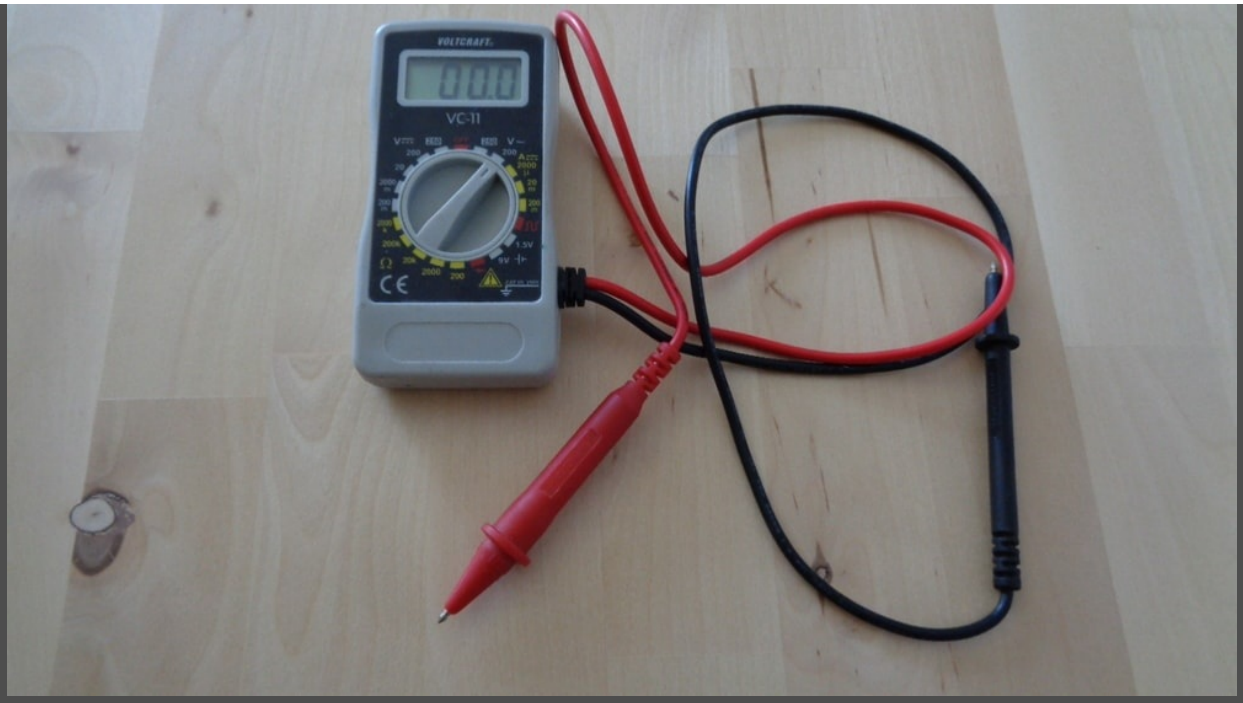


One battery holder, with clip and batteries. We use it to power the cyberdeck, so that we are no longer dependent on the power supply of the laptop.



Various components we need to provide power support.

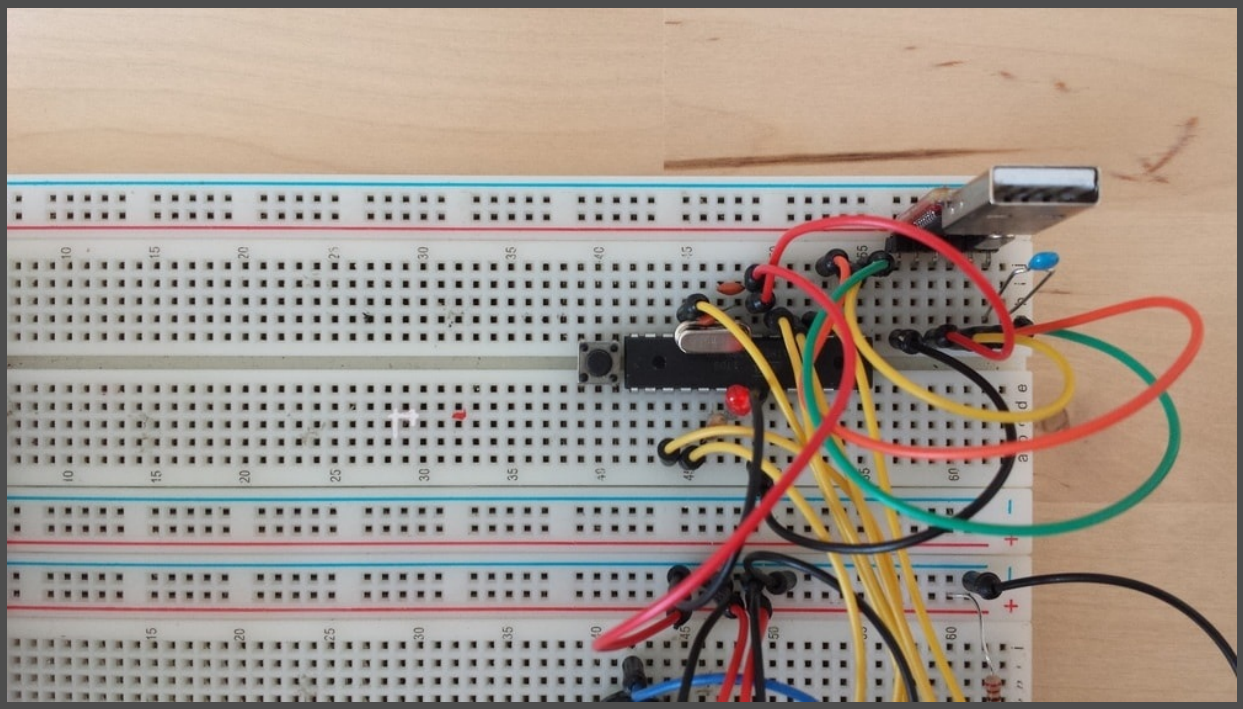




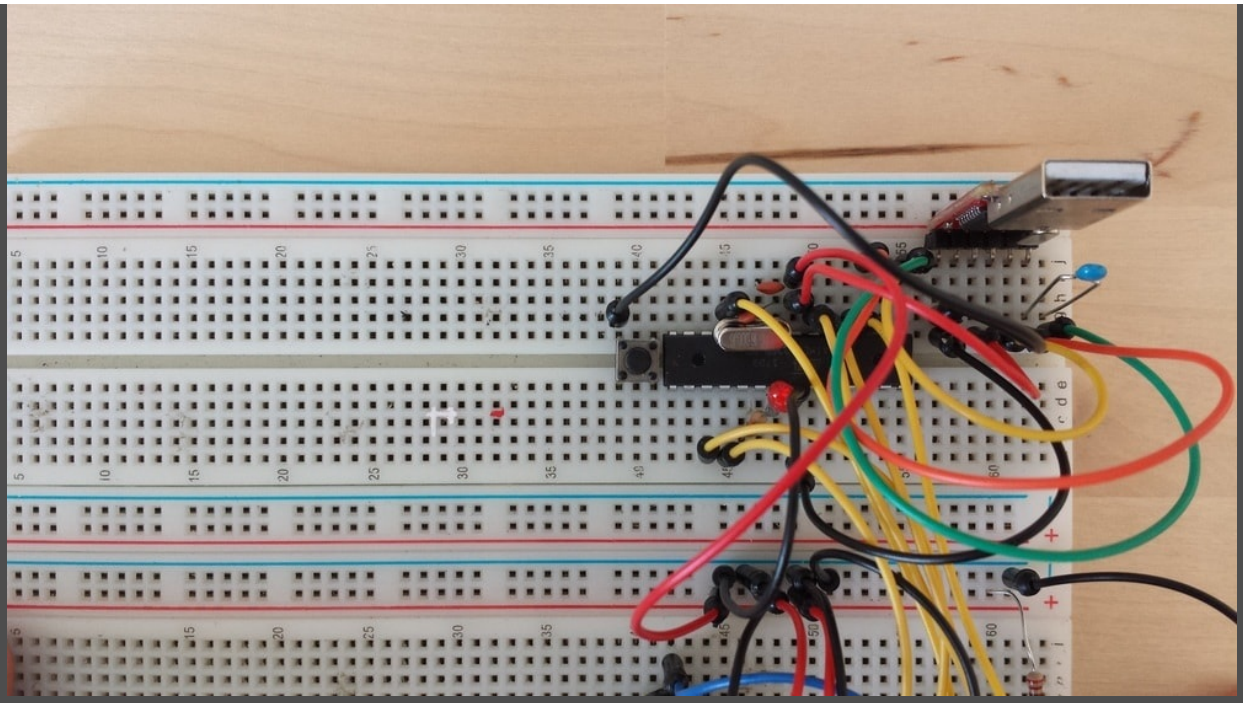
The electrical engineer's best friend. The multimeter.

- Prototype cable red(VCC)/black(GND)
- Electrolytic Capacitor 10µF
- Micro pushbutton
- Terminal block (blue)
- LED
- Battery holder
- AA cell battery 1.5V
- LM8705 Voltage Regulator
- Passive Aluminium Heatsink for LM8705
- 0.22 Ω (With a tolerance of ±5%) (Red, Red, Brown, Gold) Resistance
- Multimeter

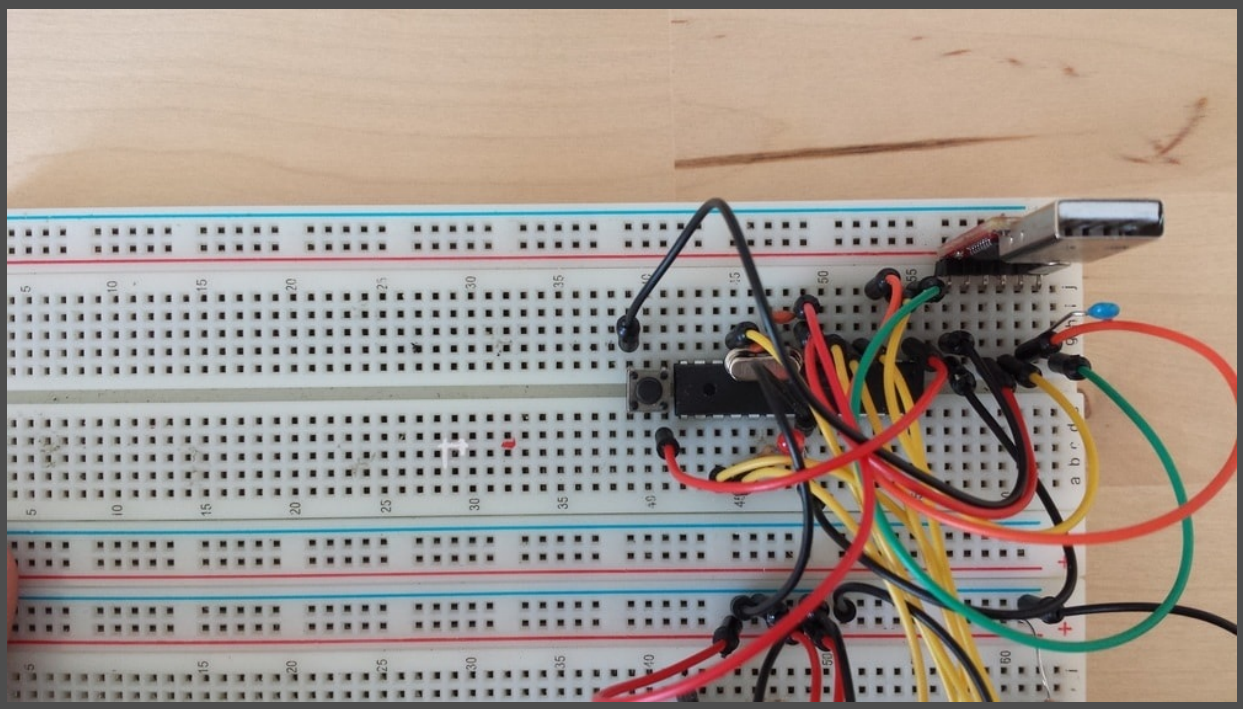
Realisation Reset button



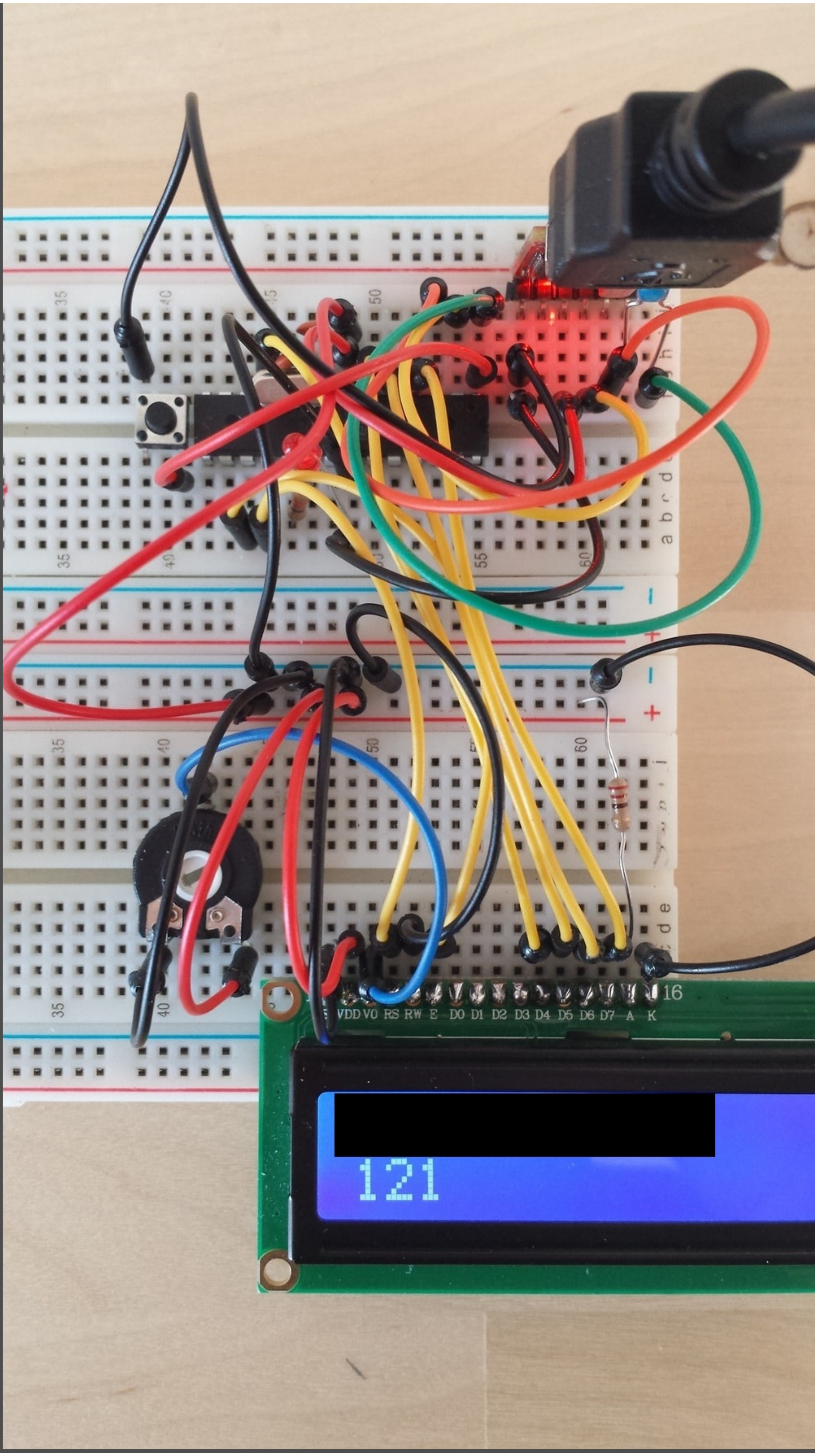
Before implementation, the entire project was rearranged once and arranged more compactly on the breadboard. This will free up space for the next updates. First, the micro button is applied to the microcontroller. The button is now on the side where there is no notch.



The black cable is connected from the `micro button` (top left) to `GND (Ground)` of the USB to TTL converter. This integrates the pushbutton into the power circuit.

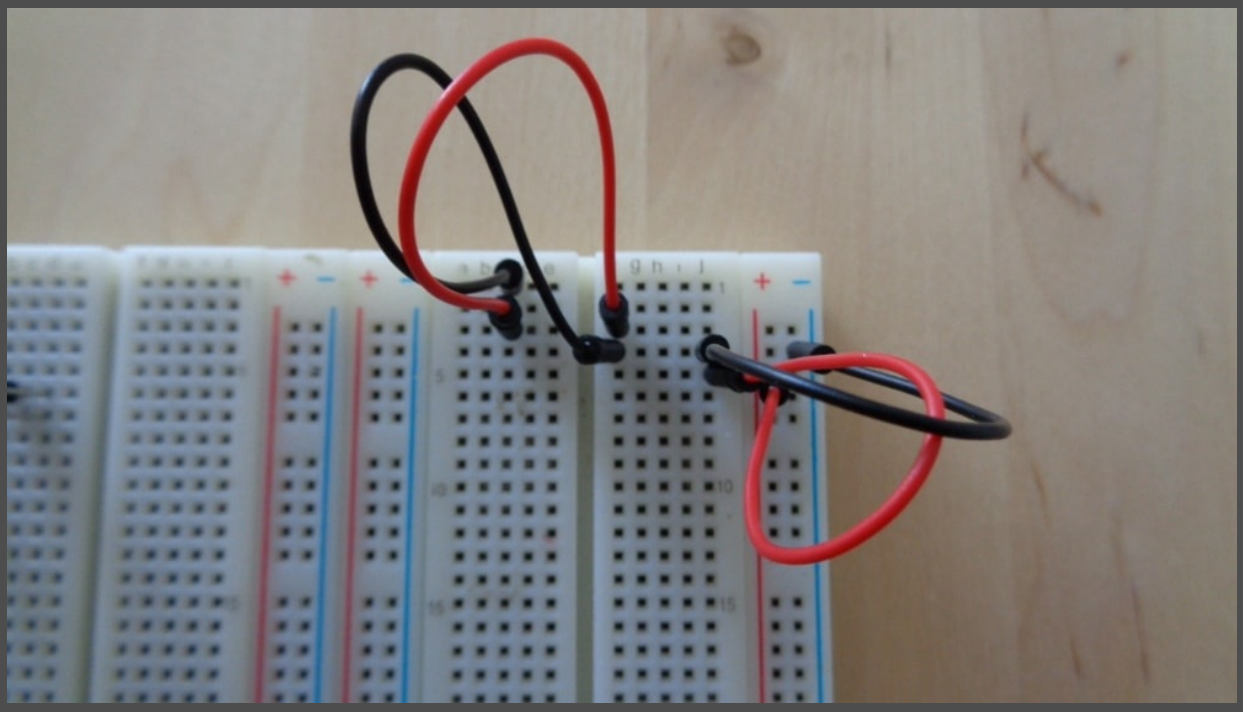


The red cable is connected from the `micro button` (bottom right) to the ATMEGA328P microcontroller at `1` PC6 (PCINT/RESET) reset. By pressing the button, the microcontroller is rebooted and starts counting again from the beginning in this example.

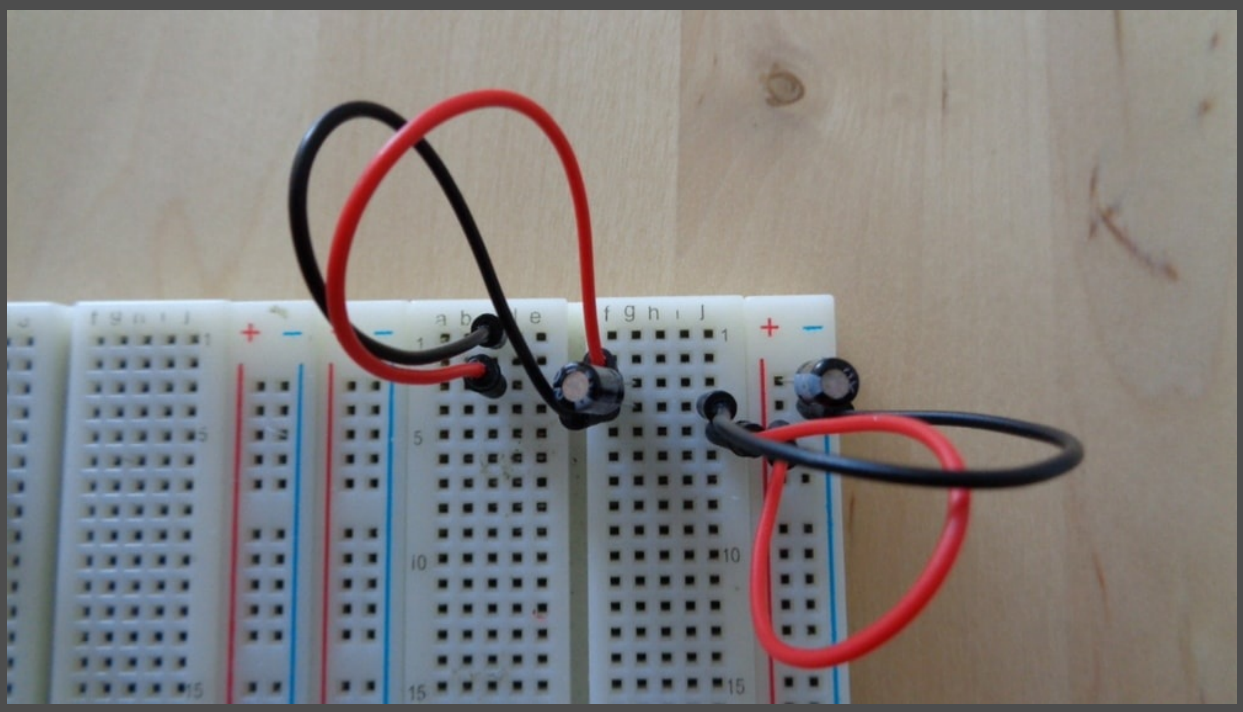

VDD V0 RS RW E D0 D1 D2 D3 D4 D5 D6 D7 A K
16
[redacted]
121

Realisation Voltage transformer

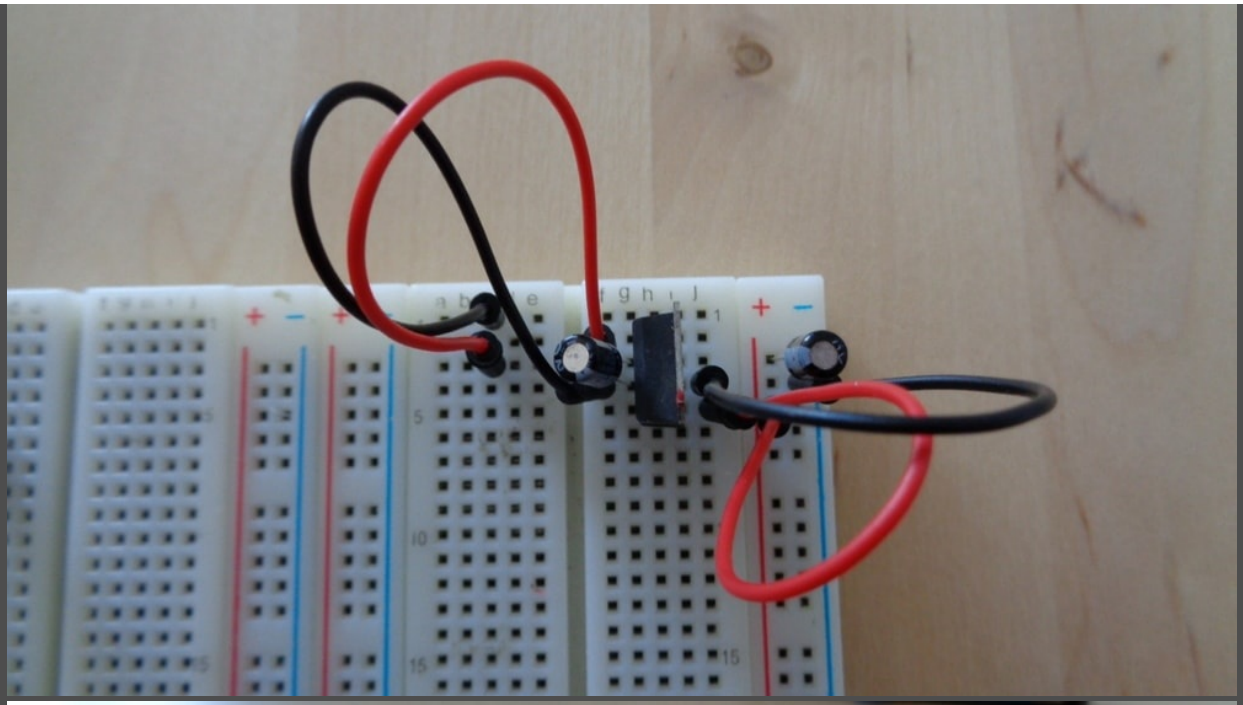
In the second part of the documentation, the voltage converter is installed. This will protect the rest of the electronics or the sensitive circuit and components from voltage peaks. It is then also possible to connect autonomous power supplies to the cyberdeck and is no longer dependent on the power supply of the USB to TTL. If microcontrollers have already been used, it is likely that there is already a preferred way to connect a power supply to the plug-in board. In the next steps, a 12v battery pack is used and converted to 5.5v6.

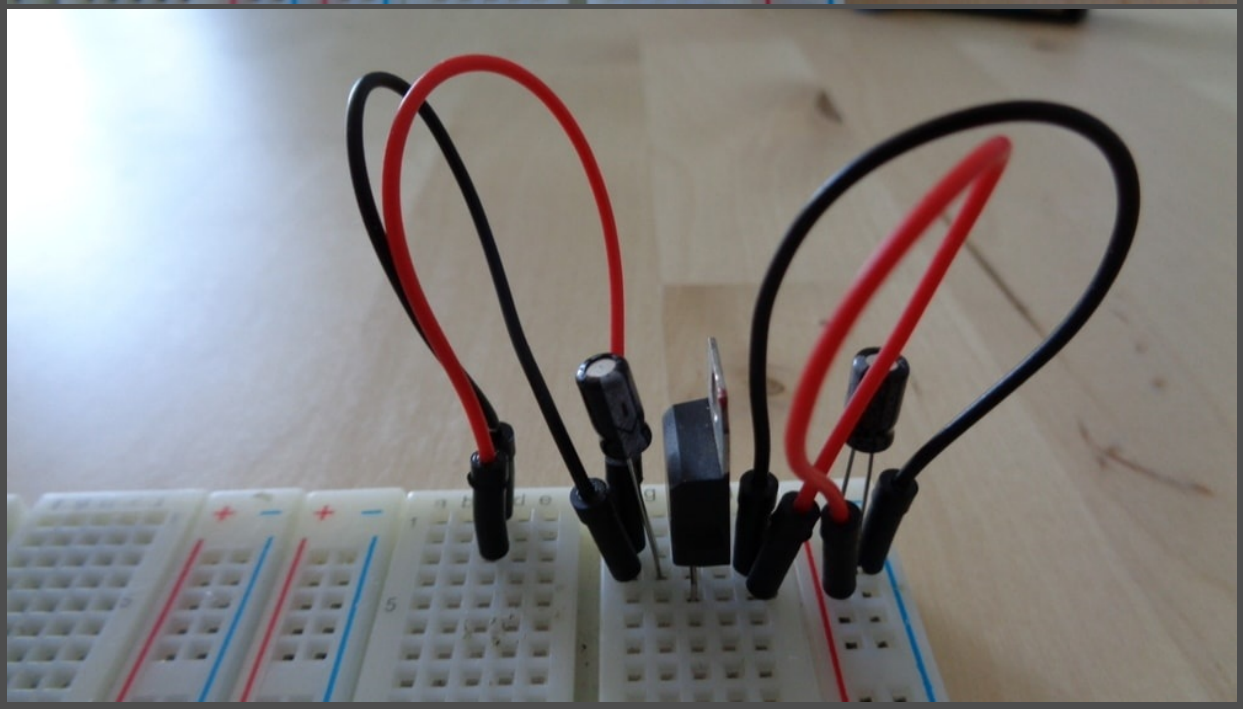


For the basic design of the voltage regulators, the current (VCC) and grounding cables (GND) are added. The circuit is located at the other end of the pinboard, so that there is enough space on the rest of the board for further components.

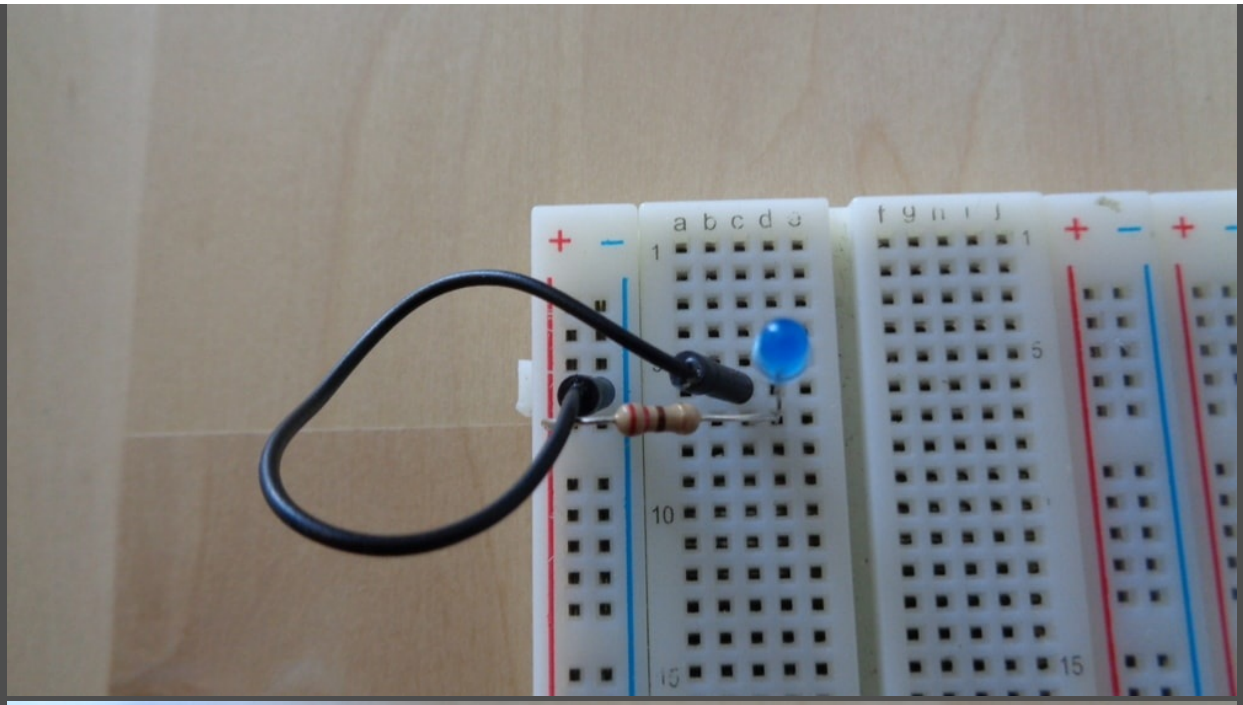


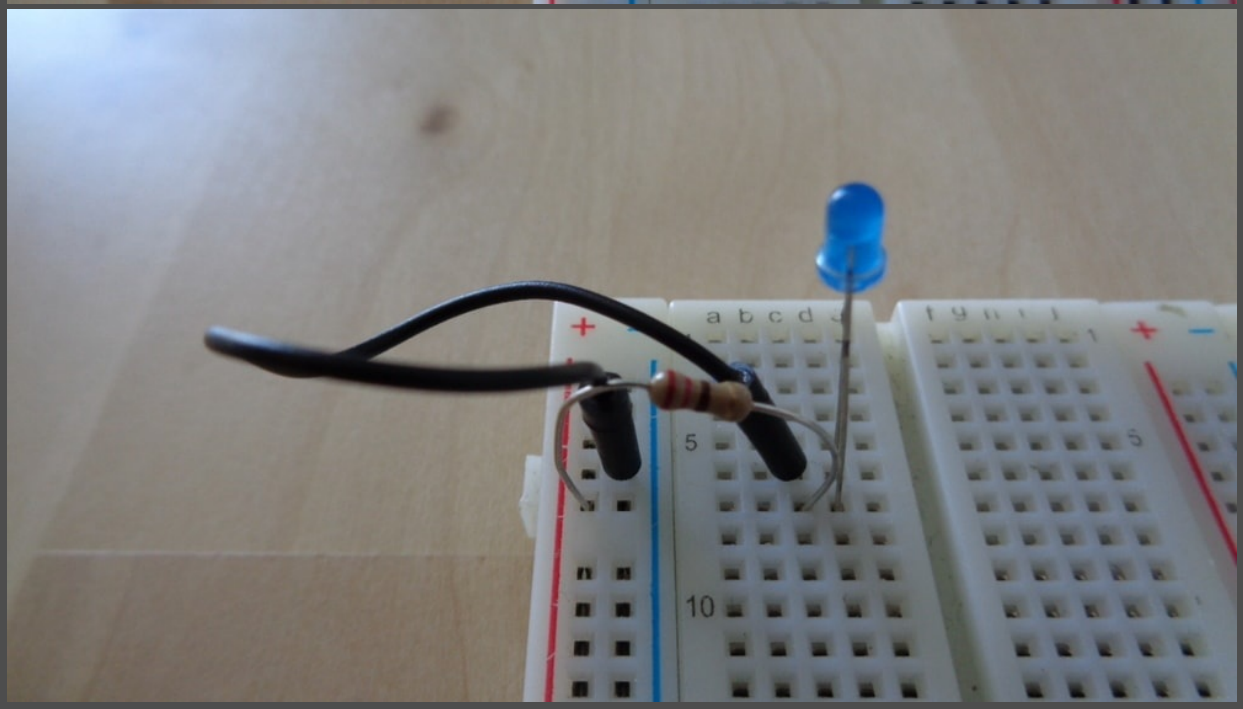
Add the two 10uF capacitors between the IN of the controller and ground and a 10uF capacitor on the right rail between power and ground. The silver strip on the capacitor indicates the earthing arm (GND).



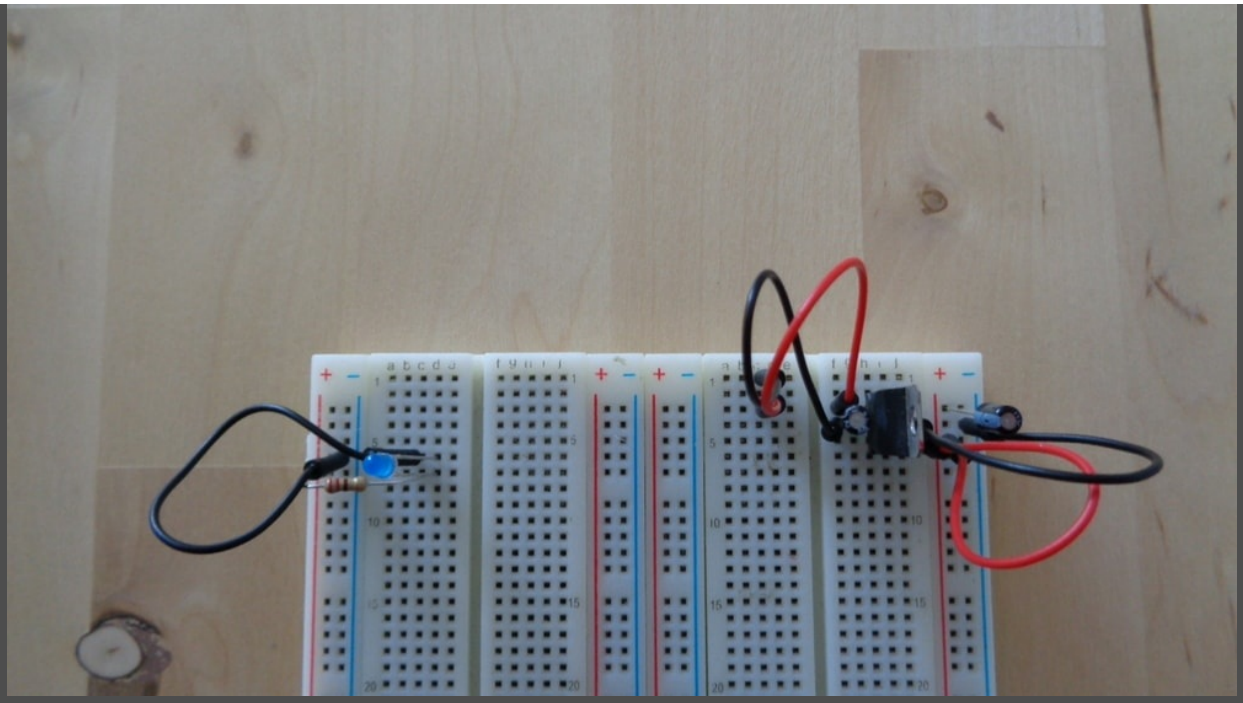


The LM87058 voltage regulator is added. The controller is a TO-220 package in which the input of the external power supply is on the left, the ground is in the middle and the 5V output is on the right.

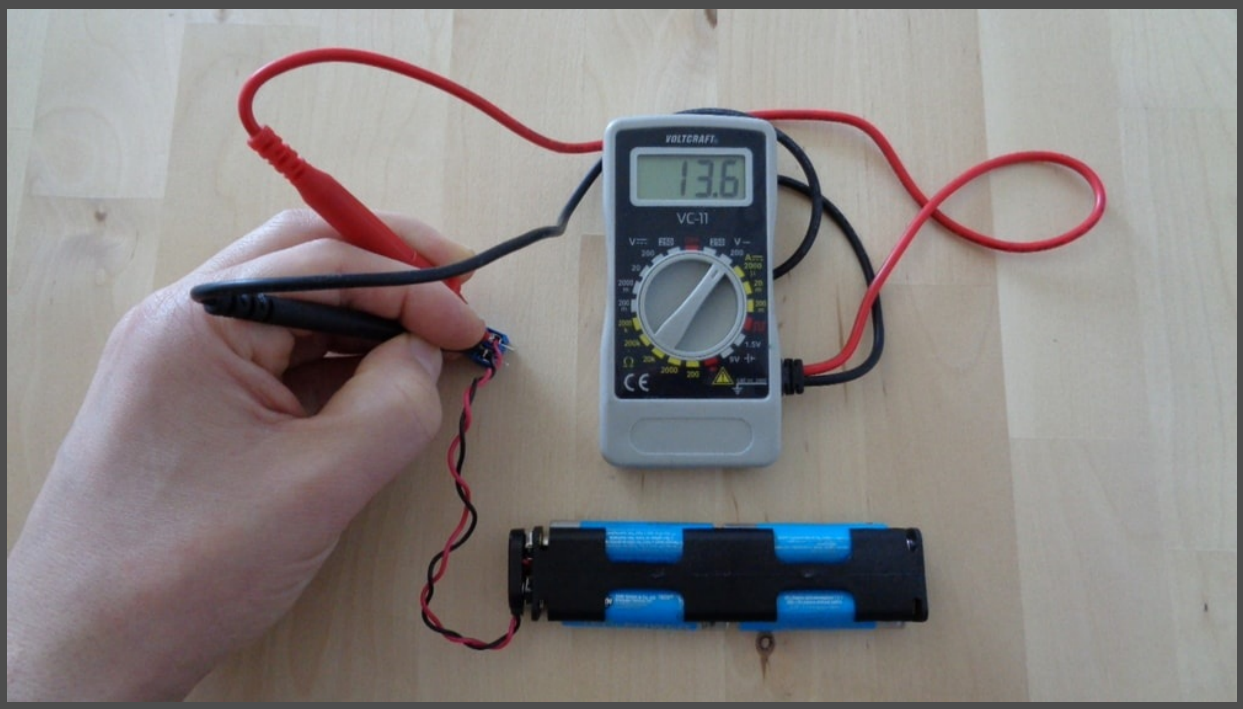


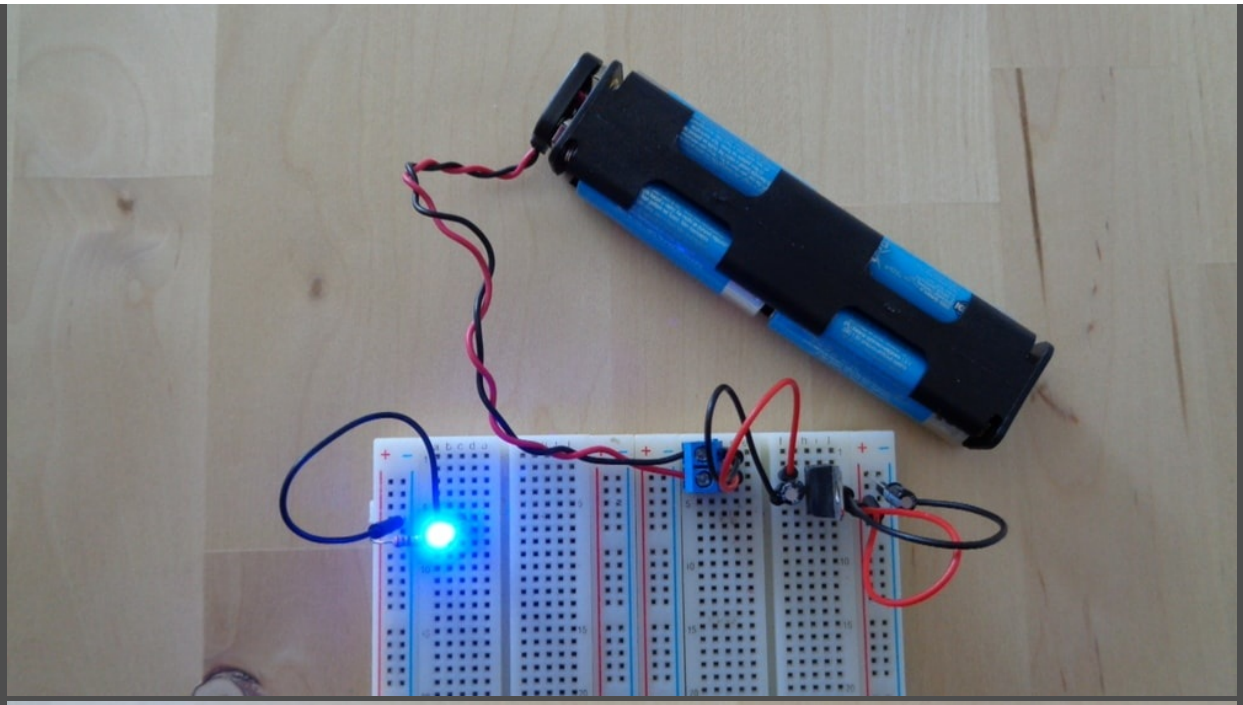


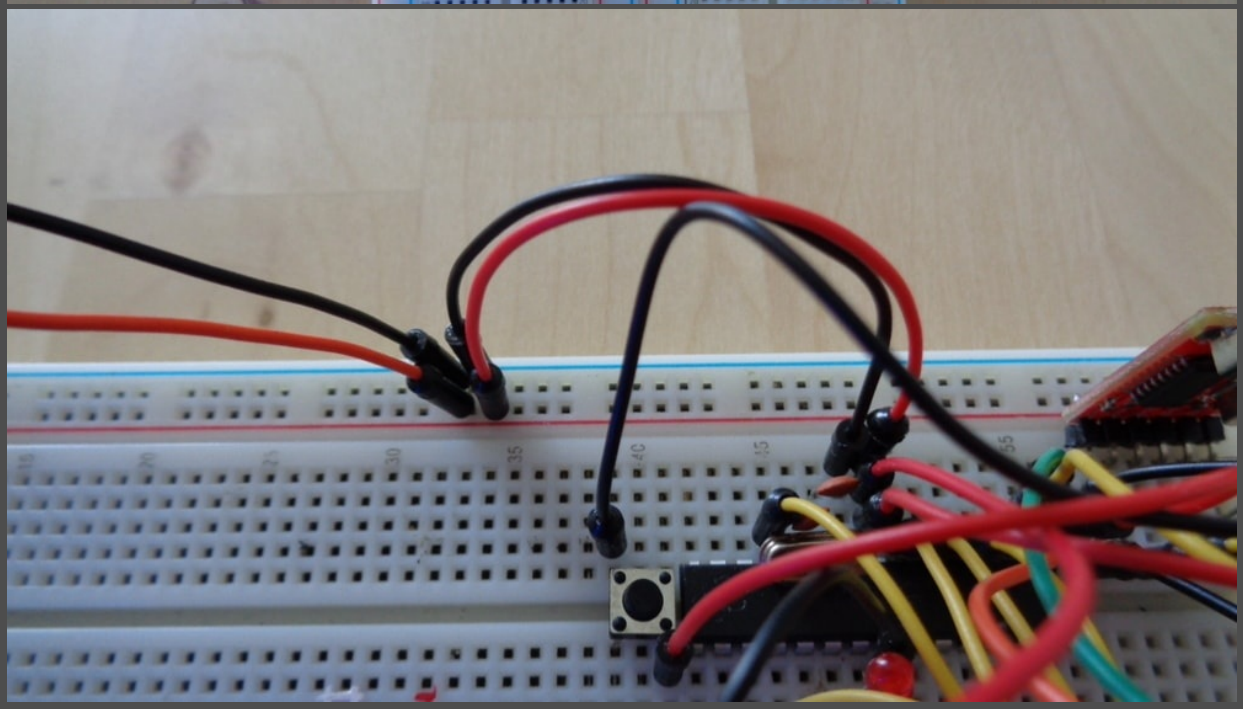
The circuit on the left side of the board consists of the LED, a ground cable and the 1× 0.22 Ω (with a tolerance of ±5%) (red, red, brown, gold) resistor. An LED connected to the power supply in this way is a great trick for troubleshooting. So you will always know when the board is powered or if it is short-circuited due to a fault.



The red and black cable to the left of the voltage regulator is where the battery pack is connected. The red cable is for VCC and the black cable for ground (GND). Care must be taken to connect only one battery pack (or power supply) between 7 and 16 V, otherwise no 5V will come out of the regulator. If the power supply is higher, the controller may be damaged. A 9V battery, 9V DC supply or 12V DC supply is suitable. Now only two cables are used and the first test of the circuit is started.







The voltage regulator is connected to the rest of the circuit with two further prototype cables. This means that the cyberdeck is no longer dependent on a power supply via the USB to TTL module. It can be operated with the battery pack until the individual batteries are empty.

Conclusion

Since the cyberdeck will not be powered by individual batteries or the battery pack, the next step will be to install a USB accumulator and a solar cell. This means that the deck can also be supplied with solar energy.